

portion of the bones of the skull. Lateral pressure does not produce this effect.

From this brief sketch of the offices of consciousness, the importance that has been claimed for it is fairly sustained. In fact, animal existence and intellect without consciousness are impossible.

Consciousness is passive; it reflects and expresses all the various motives, ideas, actions, and phenomena of the psychological faculties, intellectual, moral, and sensational; itself unchanged, "a tabula rasa"—like a looking-glass, it retains nothing of the ideas, images, and impressions that have passed over it.¹

In the above cases the name of double consciousness is a misnomer. The symptoms are only those of sudden spontaneous mental action, uncontrolled by the will. In these cases the mind wants stability, and easily wanders. Most frequently the paroxysm is of short duration.

Regarding consciousness in this light, it takes the first rank in the psychical nature of man, which could have no existence without it. As to its nature, it is enveloped in the same mystery as the mind itself, and admits of no conjecture.

ART. II.—*History of two Cases of Embolism; in one following Scarlet Fever, with recovery; in the second, connected with Disease of the Aortic Valves and Coarctation of Thoracic Aorta, ending fatally.* By J. FORSYTH MEIGS, M. D., one of the Physicians to the Pennsylvania Hospital.

CASE I.—G. H., a fine boy, ten years of age, of good constitution, returned home from school on the 9th of April, 1867, in his usual health. He found that a kitten had fallen into the cesspool at the back of the garden. Procuring a rope, with a basket attached, he spent half an hour with a companion over the mouth of the pool, inhaling its exhalations, in the endeavour to extricate the animal. This was between 2 and 3 P. M. Next morning he was not well, complaining of weakness, sore throat, and loss of appetite. I saw him in the afternoon, and found him with fever, lassitude, and sore throat. The fauces were dark red in colour, the mucous membrane turgid and smooth, and on the tonsils were patches of dark yellowish diphtheritic deposit. The lymphatic glands at the angles of the lower jaw were somewhat tumefied and hardened. I ordered ten grains of sulphite of magnesia in water every two hours, and milk-punch, supposing that the exposure to the unwholesome effluvia from the cesspool had produced an attack of diphtheria.

¹ That is the office of the mental faculty of memory.

On the following day, the 10th, in the morning, he was covered with an abundant, rather dark-coloured scarlatinous eruption; pulse very frequent; skin intensely hot; the throat dark-coloured, and its tissues thickened and turgid, with patches of false membrane of a dark, yellowish colour on both tonsils, and on the pharynx. The sulphite of magnesia was continued; milk-punch and beef-tea to be given every two hours alternately, in doses of a wineglassful.

April 11. Patient very ill; the fever intense, the pulse running up to 150; the skin very hot and dry; the eruption covered the whole skin, and was of a deep red colour, with a very sluggish movement in the capillary system; active delirium, with constant and violent jactitation, had set in; the throat was much swelled externally and internally; the whole fauces were of a deep purplish-red tint, except where patches of dark exudation were visible; and the act of deglutition had become so difficult as to convince me that diphtheritic paralysis of the pharynx, as well as acute pain on the slightest attempt to use the muscles, had combined to render swallowing almost impossible. During this day, and the three following, the condition of the patient was almost hopeless. The delirium and jactitation were constant; the fever, as marked by the heat and rapid pulse, intense. Not a teaspoonful of any fluid could be swallowed; indeed, it was doubtful whether he swallowed the water from a small piece of ice put into the mouth. The tongue was red and dryish; the urine decidedly albuminous; and the glands in front of the sternocleido muscles near the angles of the jaw, very large and very hard. The bowels acted occasionally.

During this time the treatment consisted in inunctions, with glycerin cream over the whole body every three or four hours; in the use, every two hours, of enemata of two ounces of beef-tea, with two teaspoonfuls of brandy, and twenty grains of the sulphite of magnesia, and in the almost constant application, on the front and sides of the neck and throat, of an oblong India-rubber bag, filled with powdered ice and water. At night, when the jactitation and delirium were unusually intense, ten to twenty drops of laudanum, with increased amounts of beef-tea, were given by injection. It was thought by those who watched him, that the increased quantities of beef-tea used in this way were very evidently of use in lessening the violence of the nervous phenomena.

The case went on in this way until the sixth day, when the swallowing improved a little. He began to enjoy the ice, and soon afterwards he took water and then milk-punch from a spoon. He now mended rapidly, so that by the eighth day he was taking food in sufficient quantities by the mouth, and the enemata were abandoned. Simultaneously with this change the fever abated, the delirium and jactitation disappeared, and the lymphatics, though still very hard and large, began to recede. The principal symptom now observed was extreme asthenia. The mind and

senses were clear, but the slightest exertion, whether mental or bodily, was exhausting. During all this time there had been no unusual signs of cardiac disturbance. The sounds of the heart had retained their natural character, and there had been no irregularity in the rhythm of the pulse. The treatment consisted in the use of milk-punch and beef-tea, in wineglassful quantities every two hours, with the addition of a cup of tea and a little milk toast, when he wished them; and in as complete repose of mind and body as possible. No medicine was given.

The patient continued steadily to improve. The desquamation went on rapidly and abundantly. The urine ceased to be albuminous. The strength mended, and anxiety about the case was passing away, when, on the twelfth day of the disease, Sunday, April 21, a quite new and unusual train of phenomena set in. About 3 P. M., after a comfortable morning, whilst lying quietly in bed, he complained suddenly of numbness in the left foot and leg. This was followed very soon by similar sensations in the left hand and forearm. The left leg below the knee, and the lower part of the left forearm and hand became white, almost waxy in appearance, and the child began to complain of pain in the whole leg and arm; pain which, in the foot and hand, was intense, causing great suffering and distress. About half-past three P. M. it was found that there was no pulsation perceptible in the radial artery, and farther and careful investigation failed to discover any pulsation in the vessels below the clavicle. At the same time no pulsation could be felt in the arteries of the leg below the popliteal artery, behind and a little below the knee. Sensation was affected in both arm and leg, the child complaining, when touched, of numbness and imperfect feeling, and at the same time suffering violently with pain. The pain was described as being a combination of a stinging sensation and a violent aching. As judged by the hand and by the patient's own sensations, the foot and hand were both cold. The coolness in the upper extremity extended some distance up the forearm. During this time the general condition of the patient continued unaltered; pulse 84, full, and quiet. No increase in frequency of respiration, nor in the temperature of body, as judged of by hand. Nothing abnormal in heart-sounds, except some intensification of second sound over pulmonary orifice. No cerebral symptoms; no general chilliness. There was decided difficulty in moving the arm, and the movements of the fingers were very slow and imperfect. The whole arm, and the leg below the knee, were wrapped in soft carded cotton, and then enveloped loosely in blankets. The leg was laid upon a plane surface; the hand kept rather lower than the shoulder (to assist the flow of blood into it); directions given for as absolute repose of the body as possible; the diet continued as before. Bottles filled with hot water were placed by the side of the limbs to assist in maintaining a proper temperature.

During the afternoon the pain continued, and in the evening the arm

and hand were found decidedly cold. There was also a marked diminution of temperature in the foot and leg.

22*d.* Patient passed a moderately comfortable night, suffering occasionally sharp twinges of pain. The foot and leg appear to be regaining warmth, and there is, perhaps, some tendency to a return of the natural colour; there is also less pain in them. No pulsation below the popliteal artery; hand and arm below elbow still cold; forearm and hand pale, especially hand and fingers, and fingers much shrunken. No pulsation below clavicle. Much pain caused by moving the arm to dress it; still unable to move the limb himself; pulse 88; respiration quick. Ordered one grain of sulphate of quinia with five drops of tincture of chloride of iron in mixture, every three hours. Evening: No change in condition of arm; both temperature and colour of foot and leg improving. An anodyne was given.

23*d.* Restless all night; suffered a good deal of pain; pulse 96; leg decidedly improved, the pain in foot being much less severe, but no pulsation perceptible in either tibial artery. On either side of ball of thumb and on the wrist, there are here and there dark reddish spots, which are the seat of stinging pain. The whole thumb is exceedingly sensitive, the fingers much shrivelled, wrinkled, and slightly bluish, and the nails bluish; no trace of warmth. Exposure to the air evidently increases the pain; and, after dressing, the patient suffered greatly for some time. Evening: pulse 88; perhaps a slight change for the better in the appearance of the arm; patient looks rather worn.

24*th.* Pulse 104; circulation certainly improving. Decided hyperæmia of skin about elbow and on back of forearm; the surface here presenting a faint pinkish hue, which disappears to return very slowly after pressure. Less blueness of nails and ends of fingers; hand and fingers, perhaps, a little more full in their general outline. The reddish spots noticed yesterday, though large, are less deeply coloured; pain not so marked, except when the limb is handled; pulsation as before. Evening: About the same; arm not uncovered at request of patient, who feared the pain which follows any disturbance.

25*th.* Pulse 96; fingers undoubtedly fuller, more succulent, less wrinkled, and of better colour; arm not uncovered; foot gives no pain, and is moved about a good deal in the bed. Treatment as before.

26*th.* Slept well; pulse 88; hand improving in colour, so that all apprehension about the supervention of gangrene has passed away. Whilst carefully examining the arm above the elbow, I felt distinctly a feeble pulsation in the brachial artery, an inch and a half above the insertion of the biceps, which extended about three inches in an upward direction; whilst below, at the point where the impulse ceased, the pulsating tube could be traced distinctly to be continuous with a solid cord of very small diameter, which itself could be followed down to the tendon of

the biceps, and which was evidently the brachial artery contracted upon itself, and, as yet, impervious to the feeble stream entering the vessel at a higher point. No pulsation could be felt in the axillary artery, but the subclavian could now be felt beating faintly below, as well as above, the clavicle. Evening: Gland below right ear much swollen; severe éarache.

27th. Arm still improving. In the morning, the portion of the brachial artery extending an inch and a half upwards from the biceps tendon, which yesterday was felt as a solid cord, now pulsates faintly but positively.

28th. A small artery pulsating quite strongly was felt just above and behind the external condyloid ridge; patient doing very well.

29th. Leg has recovered normal appearance, but no pulsation below the popliteal space. The capillary circulation of whole leg and foot appears perfect; dressing removed from leg.

30th. Slight pulsation felt in the radial artery.

From this time the patient did well. There was a slow and gradual but continuous improvement in every respect. The pain in the foot had entirely ceased; that in the hand remained, in a slight degree, for some weeks longer. The sensation was not so much pain, as a disagreeable pricking and burning felt in the fingers, and particularly in the thumb. These parts were, at the same time, somewhat tender to the touch, especially the thumb. The disordered sensation was still present at the end of six weeks from the date of the embolism. The desquamation was very abundant.

As to the treatment, I have only to remark, in addition, that he was kept very quiet, in the horizontal position, for a period of six weeks from the occurrence of the embolism, no greater disturbance being allowed than that produced by the effort of lifting him from the bed to a sofa. He was now allowed meat, with the ordinary vegetables, and the milk-punch was given as long as he would take it. The iron and quinia were continued for six weeks, until he was strong enough to get into the open air. The heart was examined carefully at many different periods. Its action was always regular; at first the impulse was rather feeble, but this improved gradually; at no time was there any roughening of the sounds. The only change from the healthy condition was the one already alluded to; a moderate intensification of the second sound over the pulmonic, as compared with the aortic orifice.

Remarks.—There can be no doubt that this was a case of embolism, the plugs which blocked the subclavian or axillary artery and the tibials having been detached from the left cavity of the heart. In the *American Journal of the Medical Sciences* for April, 1864, I published a short paper on "Heart-clot as a Cause of Death in Diphtheria." In that paper, the results of three post-mortem examinations, in cases in which the diagnosis had been made during life, are given. In one, the third, it is stated

that, besides the large clot occupying the cavity of the ventricle, there were found quite a number of thin fibrinoid concretions, lying on the lining membrane or between the columnæ carneæ. These concretions were stained by blood, of moderate thickness, adhered with some tenacity to the internal wall, and resembled closely the exudation which one peels off the mucous membrane of the air-passages in croup. There can be little doubt that some concretions of this kind had formed on the lining membrane of the left ventricle, in the case just described, had suddenly become detached, washed into the current of the circulation, and arrested in the arteries of the left arm and leg.

That in this case there were present the two poisons simultaneously, that of scarlatina and of diphtheria, I have no doubt. The presence of severe anginous symptoms from the very first day, the supervention of paralysis of the pharynx on the third day (a condition I have never yet met with in pure scarlatina, however violent or malignant), the early appearance of albuminuria, and the singularly marked asthenia on the decline of the more violent symptoms, all convince me that the scarlatinous poison was not the only one present in the case. Then, too, the setting in of the disease the very night after the exposure of the child to the exhalations of a cesspool, is another argument in favour of the theory of the presence of the diphtheritic poison.

This case, with those in the paper on heart-clot, just alluded to, furnish an explanation of some of those sudden and unexpected deaths during the course of scarlet fever and diphtheria, and even during an apparently favourable convalescence from these diseases, which hitherto have been referred to as caused by sudden debility, or which have been gaped at in silent horror, and dismissed as beyond all rational explanation. There are few practitioners of some years' experience, I imagine, but can recall one or more cases of this kind happening to themselves or to their brothers in medicine, which have shocked their own faith in both diagnosis and prognosis, and have afforded some ground for the carpings and cavillings of a large class of people, who go through the world in a chaos of doubts and sneers at a science the true nature and meaning of which they will not take the trouble to understand.

The history of this case adds to my previous conviction that there is a tendency in the very nature of diphtheria, and perhaps, indeed, very probably in scarlatina also, to the formation of exudation upon the lining membrane of the cardiac cavities. What may be the condition of the fluids or solids which determines the deposit, we do not yet know; but that the tendency exists is, I think, plain. The important question for medical men and for the world is, can the exudation be prevented? or, once formed, can anything be done to lessen the danger to life which it must create? As to the first point, the prevention of the deposit, I see no better method, thus far, than the use of what means experience has

shown to be the most useful in the cure of the general disease, since we are so ignorant of the special local conditions which may, in any particular case, determine the exudation, that we seem forced to depend solely upon general treatment. I have very little faith in any of the mere medicines which have been used hitherto in scarlet fever. Frequent and methodical inunction, pounded ice in bags or bladders, or cloths wrung out of iced water, applied to the front and sides of the neck when the anginous symptoms are severe, cold sponging of the whole surface when the temperature is high, the free use of iced water as a drink, sufficient liquid food—and, when the patient will not or cannot swallow, enemata of water, or beef or chicken-tea, or milk-punch, or yolks of eggs in water with brandy, given every two hours (not less if the bowel will retain them) in quantities of from two to four ounces, constitute, I believe, the best practice. The spiritus mindereri, or sweet spirits of nitre, or carbonate of ammonia, or iron and quinia, may be given internally, if they can be swallowed.

In diphtheria I have found positive benefit from the use of quinia, with muriated tincture of iron, and from frequent administrations of food—such as milk-punch and beef-tea, yolks of eggs, either by the mouth or by injection, when the patient cannot or will not swallow.

During the last winter I have used Polli's remedy, the sulphite of magnesia, in several cases of diphtheria and scarlet fever. In one case (besides the one here recorded) of scarlet fever and diphtheria following directly upon mumps (several other members of the family had true mumps afterwards), in which the diphtheritic element was much the most pronounced, in a delicate boy nine years of age, and in whom albuminuria, excessive difficulty of swallowing, rather copious hemorrhage from the nose and throat, showed a very serious attack, the patient recovered under the use of the nutrients, stimulants, and the administration of five grains of sulphite of magnesia every two hours for the first two weeks. At the end of the two weeks this remedy was given every four hours, and the iron and quinia mixture every four hours. In another case of malignant scarlet fever, the sulphite was also used, and certainly the severe symptoms moderated with unusual rapidity. Still, nothing but a long use of this drug by different hands, in different localities, and during several epidemics of varying types, can ever determine the question whether it has any real control over the effects of these poisons on human health.

We have next to consider what is to be done when there is reason to suppose that an exudation has formed within the heart, or when embolism has occurred. As to the diagnosis of clot, or exudation in the heart, the history of the case detailed in this paper shows very clearly that concretions may form within the heart without giving rise to any symptoms to reveal their existence. Though I examined the heart frequently—induced so to do by a vague feeling of insecurity arising from my pre-

vious experience in diphtheria—I found nothing in its action or in the sounds which even aroused suspicion. Now, on looking back, I can recollect the curious, the deep asthenia, under which* the child laboured; and I ask myself whether this may not have been a consequence of the state of the heart. In the cases published in this Journal in 1864, I have called attention to the diagnosis of heart-clot in diphtheria, and have there remarked upon the peculiar asthenia which accompanied those cases. In the present case the asthenia had something peculiar about it. The child was perfectly conscious, could speak and move; he ate and drank, had his little fancies, but looked weak and feeble, like a delicate infant just born. There was something touching and pitiful in his weary look, more than one usually sees in convalescence. But I must refer the reader to the papers quoted for farther discussion of this point.

As to the proper treatment should embolism occur, I can only recommend what was done in this case. The treatment here was threefold: absolute repose of body and mind; the free use of nutrients and stimulants; and the maintenance of warmth in the affected limbs. I believe that, in cases of severe disease of all kinds, entire repose is a very important part of the treatment. As little waste of the vitality as possible should be allowed. By husbanding in this way the *vis vitæ*, we seem to give nature a larger power to exert her *vis medicatrix*. The principle to be acted upon seems to be, to prolong in every way the life by saving wear and tear, and by the use of food and stimuli; and thus to give nature time to work out her own salvation. Above all, the physician should not abandon hope so long as there is life, in cases of this kind.

It was suggested, in the above case, that stimulating frictions should be made to the arm and hand, to promote the circulation. I doubt now whether they would have been of any use, and feared at the time lest any handling whatever might disturb injuriously the feeble vitality which remained in the hand and fingers.

NOTE.—This child recovered his health entirely—at least so much so as to eat and take exercise as usual. In July he was removed to a distant point on the sea-coast, where he was very well. Some weeks later he was taken to a mountain region, and the day after the journey was seized with a choleraic dysentery, which rapidly prostrated him, and ended fatally after some four or five days' illness. I did not see him in this illness, but could not hear that he exhibited any unusual symptoms of disturbance of the circulation. He died gradually, with the usual symptoms of collapse from intestinal disease. No autopsy was made.

CASE II.—I was called to visit, at one of our large hotels, on the 20th of April, 1867, a gentleman from a distance, an entire stranger to me. He was fifty-two years of age, of moderate height, well developed as to flesh, of good complexion, and, except an expression indicative of annoyance at being sick away from his home, he did not look at all ill. He

had left home some few days before by the advice of his physician, having been seized a short time before this, after a long ride in an open wagon, with pain in the loins and legs, supposed to be rheumatic. His chief symptoms at my first visit were loss of strength and appetite, occasional slight febrile symptoms, and what he supposed to be a rheumatic inflammation of the right foot. On his exposing the foot I was surprised to see an erythematous blush, with a puffy condition of the integuments, and some soreness on pressure, curiously limited so as to form one oblong patch on the instep, just over the course of the anterior tibial artery, and another one, restricted in the same way, over the line of the posterior tibial. These patches might have been two inches long by an inch wide, with irregular edges fading gradually into the healthy skin around. The pain was not very severe, and, though confined to his bed, he could move the limb freely in any direction. I was unable to detect any pulsation of the arteries under the patches, and suspecting embolism, inquired as to his history. He reported that he had been the subject, for many years, of a serious heart disease, which, however, had not prevented him from leading a very active and a very successful life as a business man and politician. He also stated that he had consulted Dr. Cammann, of New York, several years before, and that Dr. C. examined his case with unusual care and interest (of this more hereafter). On examination I found that he had severe constrictive and regurgitant disease of the aortic orifice, and a very powerful left ventricle.

Confirmed by the history and state of the heart in the diagnosis of embolism, he was informed that the case was not one of rheumatism, but a local inflammation connected with the state of the heart. Absolute repose on the bed was enjoined, a lotion of leadwater and laudanum applied to the inflamed points, an elixir of bark given as a tonic, and the advice given that he should make ready to return home as soon as possible. This treatment was pursued during five days, when, as the redness was very much diminished, the slight fever had passed away, no new embolisms had appeared, and as a careful friend was ready to accompany him home, a bandage was applied over the foot and ankle so as to produce a very moderate pressure, and he was allowed to start for home on the sixth day, with very positive directions that he should travel always in a horizontal position, and should use a crutch in going from the carriage to the hotel or train.

He arrived home safely, but suffered very much, I was told, during the last two days of his journey from pain and exhaustion.

For the remaining history of the case I am indebted to the very able physician who had attended him for many years, and who gives a most interesting account of the course the symptoms took after the patient left this city, and a thoroughly scientific sketch of the post-mortem appear-

ances. For certain reasons this gentleman prefers that his name should not be mentioned. He writes at the date of 14th June, 1867 :—

"My Dear Sir: As it will doubtless interest you, I will briefly describe the condition of your late patient from his return on the 1st of May till the time of his death on the 26th of the same month; also the post-mortem examination.

"Mr. —, for some time after his return, continued to improve; the pain and inflammation in the right foot diminished, and the approach to convalescence was so far established that, on the 15th of May I permitted him to leave his bed, to which, up to this time, I had strictly confined him. In the act of sitting up on that day he was suddenly attacked with tumultuous action in the heart, great dyspnœa, and in a short time thereafter with severe pain in the right arm, followed immediately by coldness and numbness, and total absence of pulsation in the brachial artery from the axilla downwards. The arm was kept at the natural temperature by the continuous application of external warmth, and in a few days the pain and numbness disappeared, and the natural nutrition and sensation of the limb were restored without inflammation occurring, as it did after the obstruction of the tibials of the right leg. From this time, however, the patient was subject to frequent and distressing attacks of palpitation and dyspnœa, and died on the 26th ult., with symptoms of embolism in the descending aorta, as the pulsation in both femorals was gone for fourteen hours before death, although there was strong pulse at the left wrist, and in the carotid."

Post-mortem Examination.—Age fifty-two; body not emaciated, and equally well nourished in the lower and upper limbs. A firm embolus was discerned in the right tibial, under the annular ligament of his ankle. The posterior tibial was examined, from its division into the plantars as high as the middle of the leg, but no embolus was found. It may, probably, have been broken down and washed into the plantars before his death. The right brachial was completely obstructed at its upper part, by a firm embolus of an inch in length, and a soft coagulum extended from the obstruction as high as the giving off of the circumflex arteries in the axilla.

The left ventricle of the heart was hypertrophied and dilated; the aortic valves were thickened, irregular, and ossified at several points. One of the valves was perforated by a large irregular opening, to all appearance produced by recent ulceration; the edges of the opening were soft, evidently undergoing disintegration, and the membrane covering the valves extending for some distance into the heart, as well as upwards into the aorta, was inflamed. A plug of colourless lymph occupied the perforation in the valve, and two or three similar masses were found entangled in the chordæ tendinæ. The ascending aorta was greatly dilated, its coats thickened and degenerated, and it was almost filled up by a recent

coagulum. The aorta was constricted at the descending part of the arch, exactly at the insertion of the ductus arteriosus; the constriction was only a few lines in length, as if the artery had been partially brought together by a ligature. The pervious portion would scarcely permit a No. 9 bougie to pass through it. A small sacculated aneurism was in process of formation an inch below the constriction. The abdominal aorta and iliaes were not more than half their normal size. We had no opportunity of examining the mammary and epigastric arteries. It is probable that the lower limbs derived, through this and other anastomotic channels, their principal nutrition. You will find in the last edition of "Walshe on the Heart" a drawing exactly corresponding with the coarctation of the aorta in Mr. ———'s case. The late Dr. Cammann, of New York, was consulted by Mr. ——— eleven years ago, after an attack of endocarditis, and he at that time diagnosed dilated hypertrophy of the left heart, disease of the aortic valves, dilatation of the ascending aorta, and constriction of the aorta after the giving off of the great vessels of the arch. The post-mortem examination has, as you see, verified most completely the accuracy of the diagnosis of that eminent stethoscopist. I may mention, in conclusion, that, up to his last illness, Mr. ——— led a very active life. He was very excitable, and a great local politician. He felt no inconvenience from his disease, which must have been in existence for at least a dozen years, and would never attend to the frequent warnings I considered it my duty to give him, to take care of himself. I hope you will find the above account instructive. It completely confirms the view you took of the case, which, when you saw it, was a very obscure one, especially from the unusual situation of the first obstruction in the arterial system."

Remarks.—The above case is interesting on account of the rarity of the lesion, and for the proof it gives of the possibility of diagnosing the presence of the alteration many years before death. For my own part, I had no suspicion that constriction of the aorta was present. The disease of the aortic valves which I found was all-sufficient to explain the embolism, and I looked no further. Dr. Cammann discovered the constriction eleven years before the death of the patient, but his own death, some years since, prevents me from learning the method by which he determined the exact nature of the case.

Any one who may wish to study the nature and method of diagnosis of this curious and rare lesion, will find a very full and able clinical lecture on the subject, by Dr. Walshe, in the *Medical Times and Gazette* for October 17th, 1857. The diagnosis in the case described was not proved by a post-mortem examination, but there is no reason to doubt its correctness. In the same Journal for November 21st, 1857, Dr. Walshe states that his attention had been called to a notice of two cases of the same kind, in which Prof. Skoda had made the diagnosis during life (*Wochenblatt of Vienna*, 1855).

A very clear and concise account of the alteration, will be found in *Virchow's Handbuch der speciellen Pathologie und Therapie*, Fünfte Band, Zweite Abtheilung, p. 38, by H. Lebert. Another account with some cases, in the foot-notes, is given in *Rokitansky's Pathological Anatomy* (Sydenham Society Ed.), vol. iv. p. 304. Lebert, in the work cited above, states that he has analyzed eighteen cases in *Virchow's Archiv*, Band iv., and that Rokitansky gives, in his recent work, the number of cases on record as twenty-six.

Constriction of the aorta, just at or below the point of insertion of the ductus arteriosus, which constitutes the special lesion in this case is, in all probability, nearly always the result of a congenital fault. The narrowing or obliteration of the vessel is supposed by Rokitansky to be very similar to the atrophy of the fœtal passages, as, for instance, that of the ductus arteriosus: "Such an obliteration of an artery is occasioned by the establishment of a collateral circulation, which is especially widened by a congenital narrowness (obstruction) of the artery in question." He states that this contraction and closure of the aorta have been observed from the fourteenth to the ninety-second year.

The principal points on which the diagnosis of such a case must rest are, the existence of dilated hypertrophy of the heart, frequently the signs of disease of the valves, and especially of the aortic, a loud sawing murmur over the præcordial region, loudest at the base close to the right or left edge of the sternum, transmitted upwards to the right, to the left, towards the apex of the heart, and heard in the carotid and over the vertebral column behind. The most important signs, however, the ones most to be relied upon, are those produced by the enlargement of certain collateral anastomotic channels in the upper part of the thorax, and, in some cases, a diminished size and pulsation of the femorals, occasioned by a diminished blood-supply through the contracted aorta to those vessels.

As the key to the diagnosis is to be found in the existence and discovery of the dilated vessels which carry on the collateral circulation, I shall quote from an article by Dr. Craigie, in the *Edinburgh Med. and Surg. Journ.*, vol. lvi., p. 447, a very graphic account of the route taken by the blood, from the aorta above the constriction to that vessel below that point, and to the femoral arteries. The case is one described by Mr. Joseph Jordan, of Manchester, in the *North of England Med. and Surg. Journ.*

Mr. Jordan says that "the origin and course of the aorta were as usual, but a remarkable peculiarity of form had taken place in its arch; there were dilatations at the origin of each of the three great arteries which arise from its convexity, and decided contractions between those dilatations. It was evident the blood, being obstructed at the point aforesaid, had been thrown into those three vessels, viz., *arteria innominata*, the left carotid, and left subclavian, which were greatly increased in dia-

meter, particularly the subclavian, which, on comparison, exceeded the common iliacs. The carotids were not so remarkably enlarged.

"The first set of vessels which the subclavian gives off were enormously increased in size, but particularly the *arteria intercostalis superior*, and the internal mammary. The *intercostalis superior* on each side equalled the femoral artery in size, took its usual destination, but had become remarkably tortuous and convoluted, dividing itself into several branches, some of which passed out of the chest, behind the ribs, and descended amongst the muscles of the back to inosculate with the posterior branches of the intercostal arteries of the descending aorta. But the largest branches passed in front of the ribs, and terminated, by remarkable anastomoses, with the first and second intercostal arteries of the aorta, but particularly with the first. The ribs had become deeply absorbed and sulcated in some parts by the pressure of the branches of this artery.

"The internal mammary on each side was very little inferior to the bronchial in size. They took the usual course, and terminated in five or six branches, which were continued directly into the fifth, sixth, seventh, and eighth intercostal arteries of the aorta; these latter arteries were greatly enlarged, and had become remarkably tortuous, and in some places convoluted on themselves. There was no remarkable anastomosis between this artery and the epigastric, which was of its usual size through its whole course. It is to be regretted that, the diaphragm having been removed, the size of the phrenic arteries could not be ascertained.

"The next enlarged collateral channel was the *infra-scapular* of the axillary artery, or a branch arising immediately below it. This was larger than the ulnar artery, ran down the side of the chest, under the *latissimus dorsi*, in a very tortuous manner, and terminated in the seventh and eighth intercostal arteries of the aorta."

That the collateral circulation is not always carried on by precisely the same route, is shown by the fact that, in a case reported by M. Reynaud, of a man who died at the age of ninety-two with this lesion, the epigastric arteries, instead of being of their natural size, as in the case just cited, were found to form, with the internal mammaries, one single trunk, the size of which exceeded that of the external iliacs, and which entered the crurals, which were also much enlarged.

To exhibit still farther the value of the signs furnished by the new channels which the blood is forced to take, I shall quote the symptoms observed during life in some of the reported cases. In one it is stated, that the blowing sound heard at the arch of the aorta was almost equally loud at the lower angle of both scapulæ, where two or three of the intercostal arteries were observed to pulsate with violence. There was no sound in this case along the femoral arteries, which beat so faintly that they could scarcely be felt. In another case, bulgings of the compressed and pulsating arteries were to be seen over the whole surface of the back, running in a twisted manner, and more especially diffused on both sides of the vertebral column in the direction of the axilla. In Dr. Walsh's case, the pulsations of the radials and ulnars were moderately visible and locomotive; facials visible; femorals invisible; left posterior tibial artery

very slightly so; carotids (right somewhat more than left) and subclavian violently, expansilely, visibly beating, widening base of neck at each ventricular systole; an artery, about size of radial, running vertically along right vertebral groove from posterior base of neck, visibly pulsatile; about inferior angle of left scapula arteries, visibly and locomotively pulsatile, tortuous, in the main vertical; also pulsation found horizontally in several places in the course of the ribs; two spots about inferior angles of scapulæ where heaving expansile impulse.

It must be evident from these data, that in any given case in which a suspicion may arise as to the existence of a constriction of the thoracic aorta, whether congenital or acquired, the presence of some of the abnormal pulsations above described, with or without unusual feebleness of pulsation of the femoral arteries, ought to be sought for. If found, they constitute, probably, certain—and the only certain—proof that the suspicion is well-founded; and the diagnosis in such case might be considered as established.

ART. III.—*On the Insusceptibility of Pigeons to the Toxic Action of Opium.* By S. WEIR MITCHELL, M. D., Member of the National Academy of Sciences.

DURING September of the present year it became desirable, in the prosecution of a certain research, to cause profound sleep in pigeons. For this purpose I injected under the wing half a grain of sulphate of morphia, dissolved in water. Returning to my laboratory in a few hours, I found the bird unaffected. I then injected the groin of a second pigeon with forty drops of black-drop (acetum opii), and in ten minutes gave by the mouth, through a tube, fifty-five drops. At the same time, a third pigeon took sixty drops of black-drop inwardly, and at the tenth minute received in one groin forty-five drops, and at the fifteenth minute, in the other groin, an equal amount. The latter bird soon became very awkward in its movements; but as this was possibly due to the irritation caused by the injections of the groins, I was not sure that, either in this or the companion case, I could perceive a single unmistakable sign of opium poisoning. Astounded at an immunity apparently so perfect, I endeavoured, a few days later, to discover what amount of opium was needed to kill, and obtained the following results: Pigeon took eighty drops of black-drop internally; no effect except a tendency to keep quiet; no signs of stupour; no change of pupils; feathers ruffled, as is common with these birds when sick from any cause. Pigeon received forty-two minims of black drop under skin of groin. Symptoms the same as in last case. Neither of them slept at all, and both were well the next day. Pigeon received under skin, in